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(71) Applicant(s) Eastman Kodak Company (Incorporated in USA - New Jersey) Patent Department, 343 State Street, Rochester, New York 14650-2201, United States of America	(58) Field of Search UK CL (Edition N) G2A AALA, H4F FAAG FDX INT CL ⁸ G03B 27/00 27/73, H04N 1/00 1/387 1/393 1/60 Online: WPI
(72) Inventor(s) John Randall Fredlund David Lynn Patton Roger R A Morton Steven Bruce Paciocco	
(74) Agent and/or Address for Service M D Phillips Kodak Limited, Patent Department, Headstone Drive, HARROW, Middlesex, HA1 4TY, United Kingdom	

(54) System for selecting photographic images

(57) A photographic image can be viewed and selected for initial printing or reprinting. Photographic negatives or slides are provided to a scanner to obtain image data and the image data is manipulated to provide a positive image of the photographic negatives or slides on a display means. The desired prints are then selected and order information is provided, based on the positive image as displayed on the display means. The order information is recorded to allow the desired prints to be created. The display means can be a screen of a personal computer or hard copy index print and selected prints can be zoomed or cropped by a remote photofinisher.

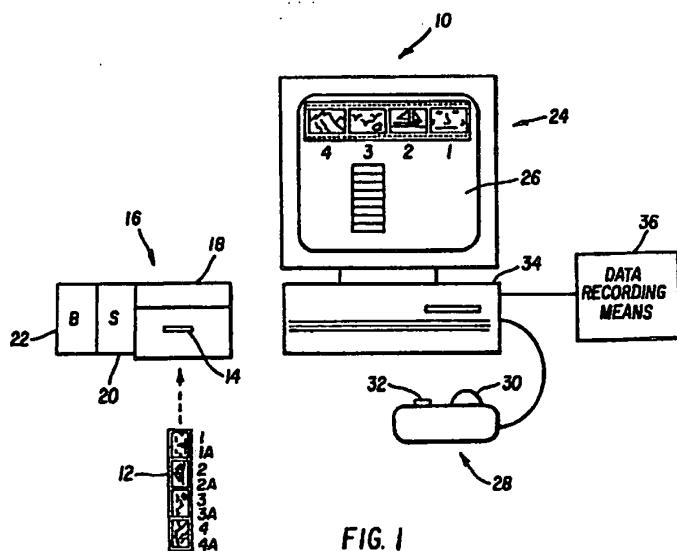
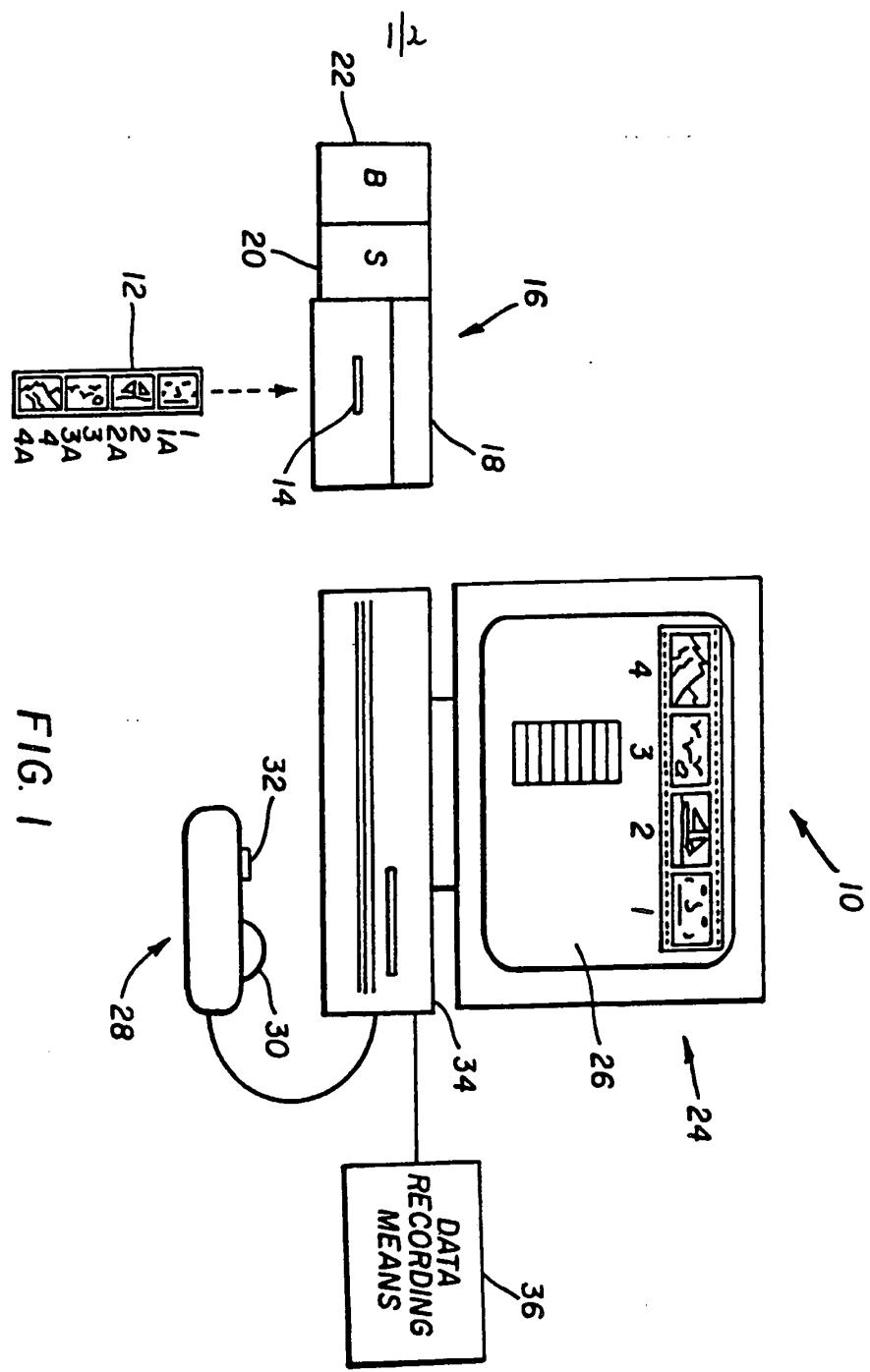


FIG. 1

GB 2 286 944 A



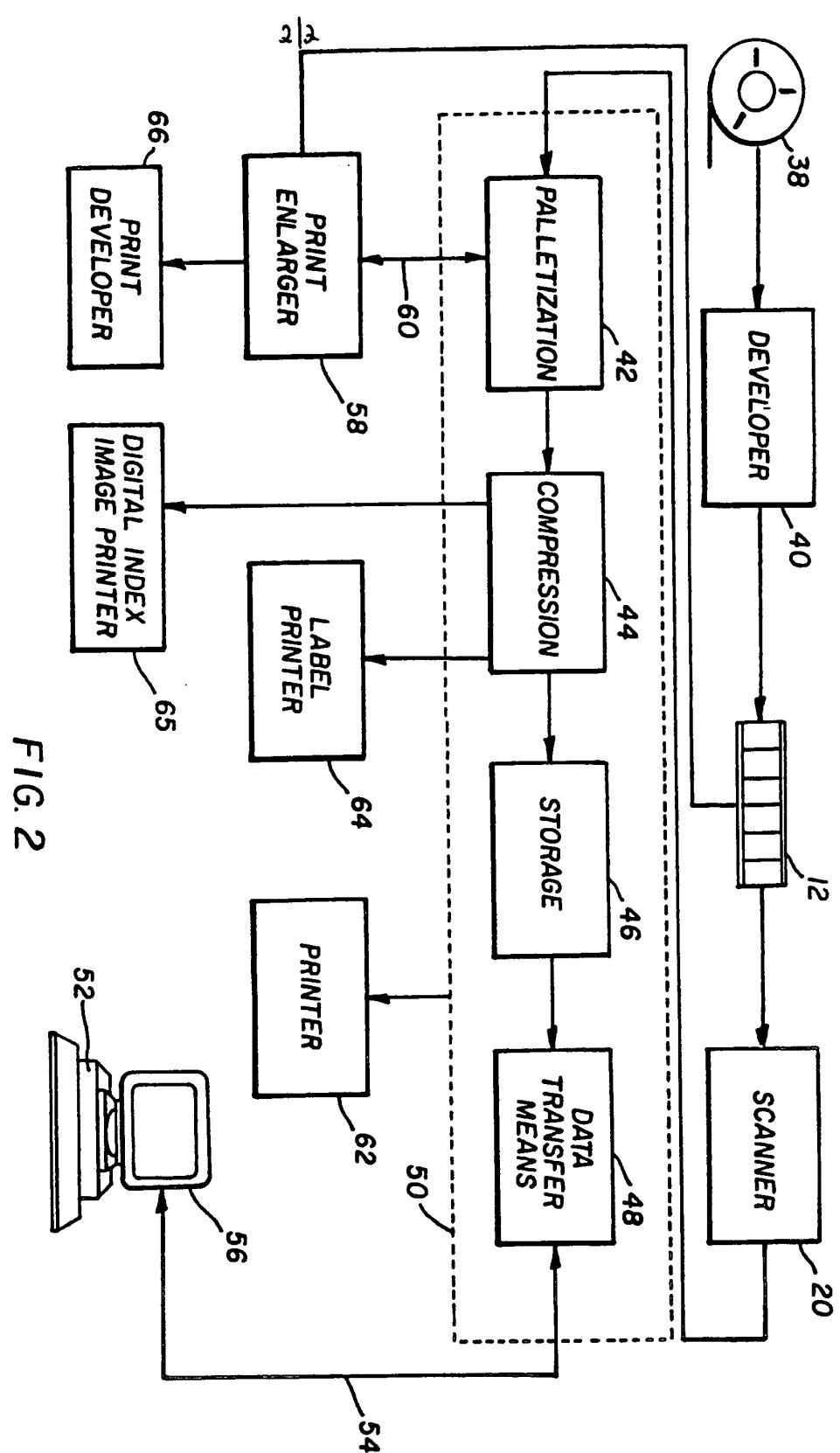


FIG. 2

SYSTEM AND METHOD FOR SELECTING PHOTOGRAPHIC IMAGES

Technical Field

5 The present invention is directed to the field of photofinishing and, more particularly, to the selection of photographic images for printing.

Background Art

10 A number of systems have been proposed for electronic processing of prints. These include Kodak's Create Print where the operator goes to a photo store or mini lab location, inserts his negatives and zooms and crops or 15 enlarges the image prior to printing. Other systems, like Kodak's Image Magic provide for a combination of a stored image with that of a "live" image of the customer, for prints which have been cropped and composed at a theme park. In addition, Photo CD provides a method for putting selected 20 images at full film resolution on a Photo CD disc.

Often, however, a consumer faces a problem in that he has received a number of prints from a photo dealer or in the mail from a photo finisher and he wishes to send additional 25 copies of these prints to other friends or relatives, or receive additional copies for himself.

In traditional photofinishing environments, there has always been the difficulty of determining which photographic negative contains the image of choice. The 30 customer often has difficulty determining which photographic negative contains the image of choice. Also, the customer often has difficulty interpreting the negative as it would appear printed. The customer must identify the images of interest on the negative by identifying each negative to the 35 prints he wants. He must then return the negative to the mini lab, photo store, or photo finisher, either in person or

by mail and then must specify the size and number of each print. He must then wait for the new prints to be made and then obtain these prints from the drug store, mini lab, or photo finisher.

5 There are a number of problems with this approach. For instance, the sensitive film negative must be handled multiple times by the customer, adding a potential for scratching, fingerprinting, and otherwise damaging the film. Also, the sleeve must be written on to convey the ordering 10 information. This works well if the customer does not insert the negatives into the sleeve before writing on it. Otherwise, there is a potential for damaging the film by writing on the sleeve while the film is within. There is also a potential for improper recording of data.

15 Furthermore, the small negative image is not easily identifiable by the customer, particularly when there are several similar images. Another problem is that the images on the film do not always line up well with the preflashed numbers on the edge of the film. The customer is often 20 confused as to whether an image is "number 9", number "9A", or number "10". This confusion can result in selection of the wrong images for reprint. Options such as zoom and crop are very difficult for the customer to specify and as a result are ordered infrequently. When a customer does order 25 reprints, the negatives may be stored haphazardly and apart from the original prints, making the negatives difficult to retrieve at a later date. Finally, this somewhat arduous process of obtaining additional prints provides little impetus for reprints. The inconvenience of ordering is a 30 barrier to ordering reprints.

It is seen then that it would be desirable to have an improved system and method for facilitating ordering and re-ordering of prints from negatives or slides.

35 Additionally, services such as zoom and crop would be ordered

more often if the ordering process was facilitated.

Summary of the Invention

5 The present invention is a system for facilitating ordering of prints from negatives or slides, and enables a customer to select size, destination, text, frames and other options associated with photographic prints. The present invention streamlines the previously inconvenient means of
10 selecting and ordering photographic reprints.

In accordance with one aspect of the present invention, a scanner is controlled by a computer to obtain image data from photographic film. The image files are
15 sufficiently clear for identification purposes, but are of low enough resolution to minimize the time needed for manipulation by the computer. The computer manipulates the data such that a positive image of the film appears on the computer display. The customer uses these images to select
20 the reprints desired. When the desired reprints have been selected, the computer records the order information. The photo finisher creates the reprints as indicated by the customer.

25 The concept of the present invention can be used for ordering of original prints, as well as ordering of reprints. For example, the customer sends exposed film to a photographic finishing company, which develops the exposed film, scans the film at low resolution, and stores the
30 scanned image. Within a predetermined period of time, the customer is able to dial a telephone number from his or her personal computer and see the prints displayed on the computer. The customer may zoom, crop, and order the desired number and size of prints from each image, among other
35 options.

An alternative embodiment of the present invention provides the customer with a method of ordering additional services from their images. An index print is created by 5 scanning the customer's negatives or slides before they are returned, and the digital images created from these negatives or slides are stored on a portable hard drive or other storage device, for later retrieval and service orders. The customer may select images and services to be performed using 10 the index print and a touch tone telephone. Alternatively, a computer/voice ordering system could take the reprint/original print order by means of references to the index print.

15 Accordingly, it is an object of the present invention to provide a system and method for facilitating ordering and re-ordering of prints from negatives or slides. It is a further object of the present invention to enable a 20 photographer to select size, destination, text, frames and other options associated with photographic prints. It is an advantage of the present invention that the previously inconvenient means of selecting and ordering photographic prints and reprints is streamlined.

25 Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

Brief Description of the Drawings

30

Fig. 1 is a of a viewing station with attached scanner, printer, and bagger means and a data entry panel, in accordance with the present invention; and

35

Fig. 2 is a block diagram of an alternative system

for remotely selecting photographic prints.

Detailed Description of the Preferred Embodiments

5 Referring to Fig. 1, there is illustrated a system
10 suitable for use in re-ordering prints from negatives or
slides. In accordance with this embodiment of the present
invention, a retail customer selects a film strip 12 from the
package of negatives or slides he or she has received from
10 the photo finisher or from his or her personal library of
older negatives or slides. This strip 12 is placed into a
slot 14 of a film handling unit 16 as shown in Fig. 1. The
film handling unit 16 comprises printer 18, scanner 20, and
bagger 22 capabilities. The printer 18 may be any suitable
15 printer such as a commercially available bar code or label
printer. The scanner 20 may be any suitable scanner,
including a linear array charge coupled device (CCD), an area
CCD, or some other means of acquiring an image. Although the
scanner may be any suitable scanner, including a high
20 resolution scanner, the preferred embodiment of this
invention is any low resolution scanner. When the
photofinisher retains the negatives or slides for eventual
printing and sends only an index print to the customer, the
scanner is preferably a low resolution scanner, and the
25 photographic material is more commonly photographic
negatives.

Continuing with Fig. 1, the film 12 moves past the
scanner 20 of the unit 16. A light source (not shown)
30 illuminates the negative so that light will pass through the
film 12 and fall on imaging electronics contained in the film
handling unit 16. The scanner 20 is capable of quickly
obtaining data which corresponds to the transmissivity of the
film with enough spatial and colormetric resolution to
35 present an adequate representation of the negative image at

an associated viewing station 24, such as a computer screen
26. The selected film strip 12 is then visible on the
computer screen 26, as shown.

5 Once the data has been obtained by the scanner 20
of unit 16, the film remains in the scanner until the
customer decides if a reprint is desired. The image data
itself is inverted and density and color transformed for
screen display before being passed to the computer screen 26.
10 Image processing algorithms, which are well known in the art,
are applied to the film data such that it is transformed into
data suitable for viewing a positive image on the computer
display 26, which is typically a cathode ray tube (CRT). The
images will appear on the CRT in the same sequence in which
15 they appear on the film strip 12. That is, images 1, 1A, 2,
2A, 3, 3A, and 4, 4A appear in the same sequence on the film
strip 12 as on the computer screen 26. Optical character
recognition (OCR), bar code reading, or other suitable means
may be used to assign a number (i.e., 1, 2, 3, 4, as shown)
20 to each image on the film strip. The customer then sees both
the image and a corresponding image number 1, 2, 3, 4 on the
screen 26, with the image numbers 1, 2, 3, 4 corresponding to
film negatives 1 and 1A, 2 and 2A, 3 and 3A, and 4 and 4A,
respectively.

25

 The customer can then use a data entry means 28 to
select the images he or she desires to have printed. Any
suitable data entry means 28 can be used, including a
trackball 30 which moves a cursor on the screen 26 and is
30 associated with a button 32 to make selections when the
appropriate option has been located with the cursor, or a
touch screen system may be used to make the desired
selections. In this manner, a simple, non-intimidating entry
panel can be used to enter all necessary order information.
35 Alternatively, a full computer keyboard could be used. The

order information may include, but is not limited to, customer ID number, date, reprint size, reprint quantity, zoom and/or crop coordinates.

5 In one embodiment of the present invention, the original negatives and prints are returned to the customer along with the index print. On the index print are the images in the customer's order, an order number, the customer's own unique ID number, and an explanation of what
10 the unique ID number enables the customer do. Instructions are printed out using a coupon printer. The customer is instructed that a digital record of their negatives was made and that by calling, for example, a 1-800 number, they can either have the digital file of their negatives deleted or
15 extended for a certain period of time, such as a month. The customer can then have a specified period of time to respond by ordering a service. If the customer does not order any service in that period of time, their file is automatically deleted. During the time period, there are several services
20 25 that they can order, and special price advantages may be offered. If any service is ordered, maintenance of the digital negatives file may be extended.

Services which may be ordered include requesting a
25 Photo CD from the digital negatives whose images appear on the index print. Digital enlargements may be made from selected digital image files whose images appear on the index print. Digital reprints made from selected digital image files may be sent directly to the customer or to any person
30 35 designated by the customer. Digital greeting cards or business cards may be made from selected digital negatives. Other products and services such as images inserted in pre-prepared templates, printed album pages, collages, etc. can be offered. Additionally, for a nominal fee, the customer can extend the length of time their digital negatives are

stored.

In an alternative embodiment, the present invention allows the customer to order additional services from their images. The index print is created by scanning the customer's negatives before they are returned, and the digital images created from these negatives are stored on a portable hard drive or other storage device, for later retrieval and service orders. The customer may select images and services to be performed using the index print and a touch tone telephone.

Alternatively, a computer/voice ordering system could take the reprint/original print order by means of references to the index print. For example, the computer/voice can require, by voice or written message, that the customer enter their index print number, whereupon the customer enters a number. The computer/voice can then require the customer to press the number of copies desired of the first print. If the customer desires enlargements of the first print, he or she can respond as required by the computer/voice. This can be repeated for each selected print.

In other alternative embodiments, once an image is displayed, the customer may zoom or crop the image before ordering the desired number and size of prints. The zoom and crop coordinates are then included in the order information. Text may be specified on the back or front of the prints, and correspondence accompanying the print may be composed. Image enhancing special effects may be applied. Specific montages of prints can also be created. Picture frames to receive the prints may be selected. The customer can also indicate whether prints are to be recorded on Photo CD, or mounted with the specified text in an album, or delivered to the

customer in some other fashion. All of these various selections can be accomplished using suitable hardware and/or software means as known in the art for achieving printing or other effects.

5

Once the order information has been entered for each image on the strip 12, the customer can choose to execute the order. A computer 34 of the system 10 will command a data recording means 36 to record the appropriate 10 information for the selected order. This data recording means 36 may be incorporated as part of the printer 18, or the bagger 22, for printing of labels or bar codes, or for providing film holding bags. The data recording means 36 could also be a separate system (as illustrated in Fig. 1) 15 for encoding reprint information directly on the film 12. Alternatively, the film 12 may be automatically inserted into a reprint bag of the bagger 22 in the film handling unit 16, with the reprint data attached to either the film or the bag. An advantage of this feature is that the customer need not 20 handle the film again after inserting the strip 12 into the scanning device 20 of unit 16.

As will be obvious to those skilled in the art, the concept of the present invention can also compile a database 25 of customers and their preferences for reprints.

Furthermore, variations on the scanning can be applied without departing from the scope of the invention. For example, instead of scanning the film at a customer accessible computer station, the film is scanned during or 30 immediately after processing by the photo finisher. Low resolution scans of the images on the film are made by the scanner which is controlled by a computer which is accessible to the photo finisher. Once scanned, the image data is manipulated by the computer such that it is suitable for 35 display, and if necessary, reduced in data content so that a

standard number of images (i.e., 24 or 36) will fit in a reasonable amount of storage space. Of course, fewer images such as six or nine at a time may be shown on a display screen for the customer. Again, numbers can be assigned to 5 each image for convenience in ordering.

A computer viewing station such as station 24 in Fig. 1 will be available for the customer to view the images and select those desired for initial printing, or for 10 reprint, in the same manner as previously described. The image files can be transferred from the scanning computer to the viewing station in any suitable manner, such as recordation on a floppy disk, or transfer via an electronic link between computers.

15

Once the reprint order has been selected by the customer, the computer can use the same means to transfer order information to the photo finisher as was used to transfer image files to the viewing station. The photo 20 finisher can then select the appropriate film negatives and create the desired reprints. Alternatively, a printed order form or other suitable means may be used.

25 Referring now to Fig. 2, the concept of the present invention can be applied to original prints as well as reprints. For example, the customer can send or take exposed film to a photographic finishing company where the film 38 is developed at developer block 40 to produce negatives 12. The negatives 12 are scanned by a low resolution scanner 20. The 30 resolution of the scanner would typically be 320 by 200 pixels and, depending on the aspect ratio and orientation of the negative, is adjusted such that there are not more than 200 scan lines in the vertical direction or 320 pixels in the horizontal direction. The reason for choosing these scan 35 formats is that they correspond to the VGA eight-bit-per-

pixel format used by IBM compatible personal computers. As the base resolution of personal computers increases, it may be appropriate to scan at a higher resolution. Additionally, the present invention can be adapted to work with narrow cast
5 cable systems, which may require other resolutions.

Continuing with Fig. 2, the image is scanned at, for example, twenty-four bits per pixel, or eight bits for each of the three color channels of the scanning device.
10 This information may then be passed to a suitable palettization algorithm block 42 which chooses the assignment of a total of 256 possible colors from all possible colors found in the specific image. The palettization process is performed on an image by image basis to produce an optimum
15 palette for each image. Suitable palettization algorithms known in the art are described in Linde, Y et al. "An Algorithm for Vector Quantizer Design", IEEE Trans. Communications, COM-28, 84-95 (1980); Heckbert, P. "Color Image Quantization for Frame Buffer Display", Computer Graphics, 16(3), 297-307 (1982); and Braudway, G. "A
20 Procedure for Optimum Color Choice of a Small Number of Colors From a Large Color Palette for Color Imaging", Electronic Imaging 1987, San Francisco, CA (1987), all incorporated herein by reference.
25

The data representing the palettized image is compressed, for example by using a lossless compression scheme such as Lempel Ziv Q Coder or DPCM or RADPCM in a lossless form at the compression function block 44.
30 Compressed image data is then stored in storage block 46 before being transmitted to the customer via a data transfer means, such as modem 48. It will be appreciated that Fig. 2 illustrates a functional flow of the image. In fact, functions 42, 44, and 46, as well as modem 48, can be
35 functionally performed as software by a computer 50, as

indicated by the dotted line in Fig. 2. The palletization and compression of low resolution images is carried out to minimize the data which is to be transmitted. It can be appreciated that any means to minimize the time and expense of image transmission could be used and is desirable.

At a remote location, personal computer 52 communicates with modem 48 through telephone lines 54. By using appropriate identification, the owner of the personal computer 52 is able to access the scanned and stored images contained in storage block 46. These images are then transferred through the data transfer means 48 to personal computer 52 where the images are sequentially displayed on display 56. The operator of the personal computer 52 is able to execute a suitable program which has been created by a programmer of ordinary skill in the art. The program enables the operator to select the number of each image desired, which numbers correspond to negatives of strip 12, and the size of each print. This program may also be transmitted along with the images.

The information selected by the operator, including zooming and cropping, choice of image sizes, letters and addresses associated with specific images, text on the back of images, insertion of images in pre-prepared backgrounds, etc., is communicated through line 54 to a data transfer means such as modem 48 and computer 50.

The computer 50 also controls a print enlarger 58. Specific frames with zooming and cropping are identified by the data from the personal computer 52 and are sent to computer 50. This data is then sent on line 60 to print enlarger 58 to control the exposure of print material with the correct sizing of each print under the control of the computer 50. In effect, the computer 50 controls

magnification and predetermined position of the enlarger lens to provide the zooming and cropping specified by the operator of the personal computer 52. Alternatively, printing may be executed digitally. Computer 50 can manipulate scanned high 5 resolution image files such that the desired prints or photo CD's are created.

The computer 50 can also output on printer 62 any text associated with the image, including cover letters or 10 correspondence to be sent along with specific prints and instructions regarding the selection of picture frames. Printer 62 can also be used to print out billing information to be mailed along with the prints.

15 A label printer 64 can be used to print out labels for inclusion in albums or on the backs of prints, based on information provided by the operator of the personal computer 52. Instructions can also be provided to the operator of print developing equipment 66 in terms of frame selection and 20 which negatives are to be scanned for inclusion on a Photo CD. With this embodiment, it is not necessary for the negatives to be returned to the customer, as he or she can remotely access the images. Consequently, the photo finisher can store and index negatives for later retrieval, either as 25 negatives or in electronic form.

In another embodiment of the present invention, the customer can receive a proof sheet of his or her photographs for each roll of film that is processed. Referring still to 30 Fig. 2, after the negatives 12 are scanned by the scanner 20 and processed by the computer 50, the proof sheet is generated via digital index image printer 65 and provided to the customer. The proof sheet allows the customer to preview his or her pictures before accessing computer 50 via a touch 35 tone telephone or modem 48. In this embodiment, the computer

50 could communicate data to another computer which would handle incoming calls. Additionally, another computer could be used to handle printing orders. Allowing the customer to do this will result in a more efficient use of his or her
5 time since the customer will only access the pictures of interest. This system provides added value to the customer by providing the customer with only the images of interest to the customer.

10 In such an embodiment, the original negatives and prints may be returned to the customer along with an index print. On the index print are the indexed images in the customers order, and relevant information such as an order number and the customer's own unique ID number. An
15 explanation of what the index print enables the customer to do can also be enclosed with the index print. The instructions can be printed out using a coupon printer. The customer is informed that a digital record of their negatives has been made and that they may dial a 1-800 number to either
20 have the digital file of their negatives deleted or maintained for a period of time. Alternatively, the photofinisher can keep the negatives for use in optical printing when the customer places his or her order. If the customer chooses to maintain the digital file or make a print
25 order, the customer then has that specified period of time to respond by ordering a service. If the customer does not order anything within that time period, their file is automatically deleted. Or, alternatively, the negatives could be destroyed or returned. During the time period,
30 there are several services that can be ordered, and special prices may apply. Ordering a service may also extend the maintenance of their digital negative files. Services may be ordered using a touch tone telephone and the unique ID number, without requiring additional personnel to take the
35 orders. As images are discarded by the customer, the storage

devices can be reused.

According to the present invention, photographic images for printing are selected by providing photographic 5 negatives or slides to a scanner to generate an image file. The image file is then manipulated to provide a positive image of the photographic material on a display means. Desired prints and services are selected using the positive 10 image of the photographic material as displayed on the display means, which provides order information. The order information is then recorded and delivered to a printing means. The order information can be for initial prints or reprints, and can be transferred to the printing means by electronic means, magnetic means, or bar code means.

15

The present invention also provides the customer with a method of ordering additional services from their images. An index print is created by scanning the customer's 20 negatives before they are returned, and the digital images created from these negatives are stored on a portable hard drive or other storage device, for later retrieval and service orders. The customer may select images and services to be performed using the index print and a touch tone telephone. Alternatively, a computer/voice ordering system 25 could take the reprint/original print order by means of references to the index print. For example, the computer/voice can require, by voice or written message, that the customer enter their index print number, whereupon the customer enters a number. The computer/voice can then 30 require the customer to press the number of copies desired of the first print. If the customer desires enlargements of the first print, he or she can respond as required by the computer/voice. This can be repeated for each selected print.

35

As will be obvious to those skilled in the art, various modifications of the present invention are possible without departing from the scope of the invention. For example, in the "stand alone" embodiment of the present invention, the customer inserts his or her negatives into the scanner and the order information is captured, recorded, and transferred to the printing means. In the "phone and index" printing system embodiment of the present invention, the customer is able to order goods and services via a telephone, by looking at the index print and making selections on the touch tone pad. In the "personal computer" embodiment of the present invention wherein images are transmitted to a personal computer, the consumer can download his or her low resolution images to a personal computer, via a data transfer means such as a modem or transported disk, and select products which the photofinisher can execute upon receipt of the order information. Of course, scanner 20 could be a high resolution scanner in all cases where digital final prints, not index prints only, are delivered to the customer.

20

Industrial Applicability and Advantages

The present invention is useful in the field of photofinishing in that it reduces the inconvenience of ordering prints and reprints from photographic negatives. The present invention has the advantage of streamlining the previously inconvenient means of selecting and ordering photographic prints and reprints. The present invention has the further advantage of decreasing the multiple handlings of sensitive film negatives by the customer. The present invention offers the potential for eliminating unwanted prints by allowing the customer to peruse the images before ordering an initial printing of the negative. The present invention also has the advantage of eliminating improper recording of data. Finally, the present invention has the

advantage of making negative images more easily identifiable by the customer, particularly when there are several similar images.

5 Having described the invention in detail and by reference to the preferred embodiment thereof, it will be apparent that other modifications and variations are possible without departing from the scope of the invention defined in the appended claims.

PARTS LIST

	10	SYSTEM
5	12	FILM STRIP
	14	SLOT
	16	HANDLING UNIT
	18	PRINTER
	20	SCANNER
	22	BAGGER
10	24	VIEWING STATION
	26	COMPUTER SCREEN
	28	DATA ENTRY MEANS
	30	TRACKBALL
	32	BUTTON
15	34	COMPUTER
	36	DATA RECORDING MEANS
	38	FILM

What is claimed is:

1. A method for selecting photographic images and services related to selected photographic images, comprising
 - 5 the steps of:
 - a) scanning a photographic film bearing a plurality of images to generate an image file;
 - b) manipulating the image file to provide a positive display of the images in said image file on a
 - 10 display device;
 - c) selecting an image from said display device, and a service to be provided with respect to said selected image, said service being selected from the group consisting of the number and size of prints to be made from said
 - 15 selected image, picture frames for the prints, a photo CD of selected images, a zoomed and cropped image, correspondence related to the selected prints, and a destination for sending the selected prints;
 - d) recording order information including an
 - 20 identification of said selected image, a description of said selected service, and a customer identification; and
 - e) delivering said order information to a photofinisher.
- 25 2. The method claimed in claim 1, wherein said display means is a personal computer remote from said photofinisher, said image file is transmitted to said personal computer via modem over telephone lines and said order information is delivered to said photofinisher via
 - 30 modem over telephone lines.
- 35 3. The method claimed in claim 1, wherein said display means is an index print having a plurality of images and a corresponding plurality of index numbers and said order information is delivered to said photofinisher via touch tone phone.

4. The method claimed in claim 2, wherein a computer program related to the image file is also transmitted to said personal computer.

5 5. The method claimed in claim 4, wherein said computer program enables the operator of the personal computer to select the image from the display.

10 6. The method claimed in claim 1, wherein said service further comprises zoom and crop of said selected image.

15 7. The method claimed in claim 1, wherein said service further includes image enhancing special effects.

8. The method claimed in claim 1, wherein said service further includes greeting cards.

9. The method claimed in claim 1, wherein said 20 service further includes business cards.



Application No: GB 9503665.3
Claims searched: 1-9

Examiner: Huw Jones
Date of search: 28 April 1995

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.N): H4F - FAAG, FDX; G2A - AALA

Int Cl (Ed.6): G03B - 27/00, 27/73; H04N - 1/00, 1/387, 1/393, 1/60

Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	WO 92/05660 A1 (KODAK) - see 1.4-16 p.8 and 1.23 p.9-1.12 p.10	1,6-9

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.